

## Disseminated Infection Due to *Blastobacter denitrificans* following Routine Appendectomy in an Adolescent

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**Until now, *Blastobacter denitrificans* has not been mentioned in the context of human infections. A case of severe complication caused by *B. denitrificans* after routine appendectomy in a young girl is described and confirms this organism to be an opportunistic human pathogen.**

### CASE REPORT

A 12-year-old girl was initially admitted to a general hospital for a routine appendectomy. After the operation, she presented with local abscesses and pneumonia accompanied by severe effusions of the pleura and pericardium (Fig. 1). The girl is the first child of healthy parents and grew up normally. She suffered from bronchial asthma, but no immunological disorders were apparent. There are two more sisters and two twin brothers. One of her sisters became deaf following an episode of meningitis.

With routine diagnostic methods, we found no evidence for bacterial, fungal, or viral infections to explain the disseminated disease after the appendectomy. Clinical specimens during her stay at the Center of Pediatrics at the University Hospital (Magdeburg, Germany) were reanalyzed for microorganisms by molecular techniques (3, 6, 7). We performed a broad-range PCR with universal primers of the eubacterial 16S rRNA gene and subsequently sequenced this gene (5). Only *Blastobacter denitrificans* could be identified in two clinical specimens, one derived from pneumonia-related effusion and the other from the tip of the central venous catheter. The analysis was performed as described previously; the alignment was 100% (BLAST search, gb/946917.1/S46917) (2). Thereafter, an aliquot of the pneumonia-related effusion that had been stored was plated onto agar medium prepared as described for the medium 1521 PYGV (American Type Culture Collection, Manassas, Va.; <http://www.atcc.org/SearchCatalogs/MediaFormulations.cfm>) and incubated at 30°C in air. After 2 weeks of cultivation, small colonies were evident on plates. The bacteria were gram-negative rods and were positive for urease, nitrate reduction (disimilatory), esculin hydrolysis, oxidase, and catalase; the test for indole production was negative, and acid production from D-glucose was not found. The phenotyping strongly indicated that the organism was an alpha-proteobacterium. The identity

of the isolate was subsequently confirmed by sequencing of its 16S rRNA gene (7).

Until now, the interest in *B. denitrificans* was in the synthesis of pharmaceutical chemicals for agriculture or in chiral synthesis of compounds in organic chemistry. There are no clinical reports about *B. denitrificans* as a human pathogen in a healthy or immunocompromised person. This may be due to the failure of routine diagnostic methods in its detection, since culture of this organism is difficult. *B. denitrificans* is a member of the alpha-2 subgroup of the *Proteobacteria* and shows a very close phylogenetic relationship with the genus *Afipia* (9). In addition to *Bartonella henselae*, the microorganism *Afipia felis* has been correlated with cat scratch disease (1). Endocarditis is well known to be a complication in *Bartonella* infections, and infections with *Afipia* occur especially in immunocompromised patients. Also, after reanalysis of the clinical specimen, there was no indication of an infection with *Bartonella* spp.

There is only some information about the antibiotic susceptibility of this group of bacteria. For *A. felis*, which is a facultative intracellular bacterium and multiplies in macrophages, only aminoglycosides were found to be bactericidal (4). *Bradyrhizobium* strains showed a wide diversity with regard to intrinsic antibiotic resistance (8). In cases of complicated cat scratch disease caused by *Bartonella henselae*, treatment with trimethoprim-sulfamethoxazole, ciprofloxacin, or azithromycin is recommended, with gentamicin being reserved for severely ill patients (10). In the reported case, therapy lasted for about 1 month and included abdominal reoperation (cecal abscess formation) and pleural and pericardial drainages after appendectomy. Several antibiotic regimens were implemented. In this regard, the antibiotic therapy was started in the general hospital 1 week after routine appendectomy, when the signs of fever, local abscesses, and pleural empyema appeared. A combination of ceftriaxone, metronidazole, and ampicillin was applied initially and was changed to ceftazidime, gentamicin, and vancomycin 5 days later. After another 5 days, the child was transferred to the Center of Pediatrics at the University Hospital (Magdeburg, Germany). The antibiotic therapy was changed to a combination of imipenem, gentamicin, and vancomycin for a period of 2 weeks. Ultimately, the girl left the hospital in good condition. To get some information about the

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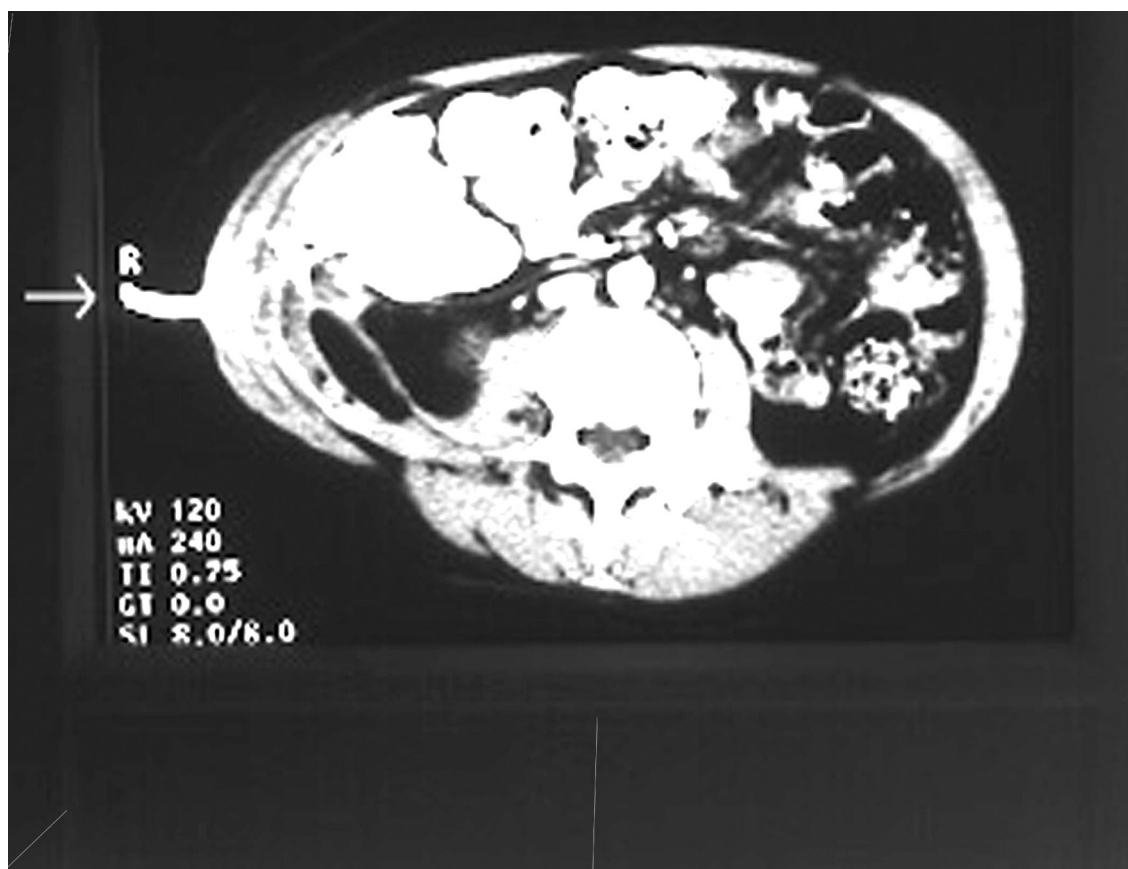


FIG. 1. The abdominal computer tomography of the patient is shown. On the right side of the patient (R) an organized abscess with necrotic tissue and fluid is visible. The arrow indicates the drainage on the right side; the drainage lies in the abscess ending near the intestine, which is filled with contrast medium.

antibiotic resistance pattern of the isolated *B. denitrificans* strain, we performed agar diffusion tests on 1521 PYGV agar plates; the incubation time was 10 days. With regard to the applied antimicrobial substances, the strain was sensitive only to imipenem. This is the first report of severe complication caused by *B. denitrificans* in a healthy person and confirms the potential of environmental bacteria to cause human disease.

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